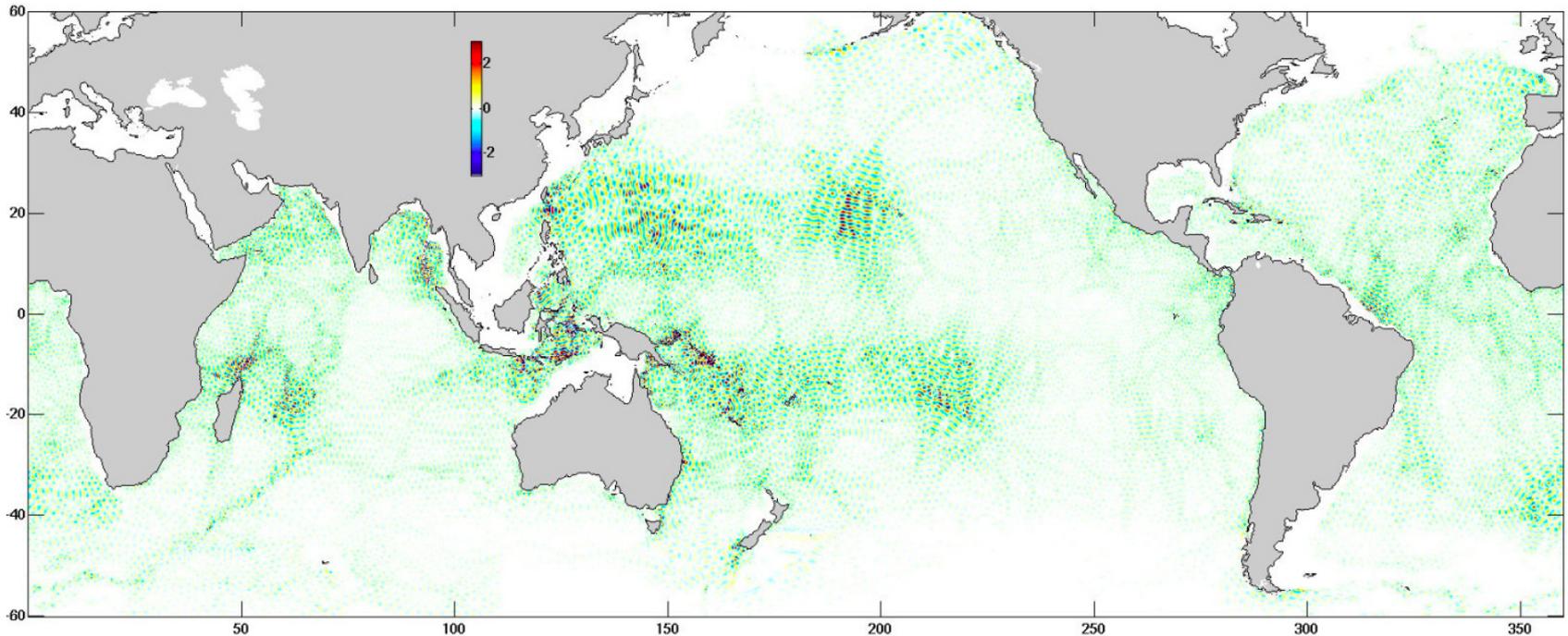


Tides Working Group

- **Internal tides: coherent and incoherent**
- **Barotropic tides--improved corrections in coastal areas, high latitudes**

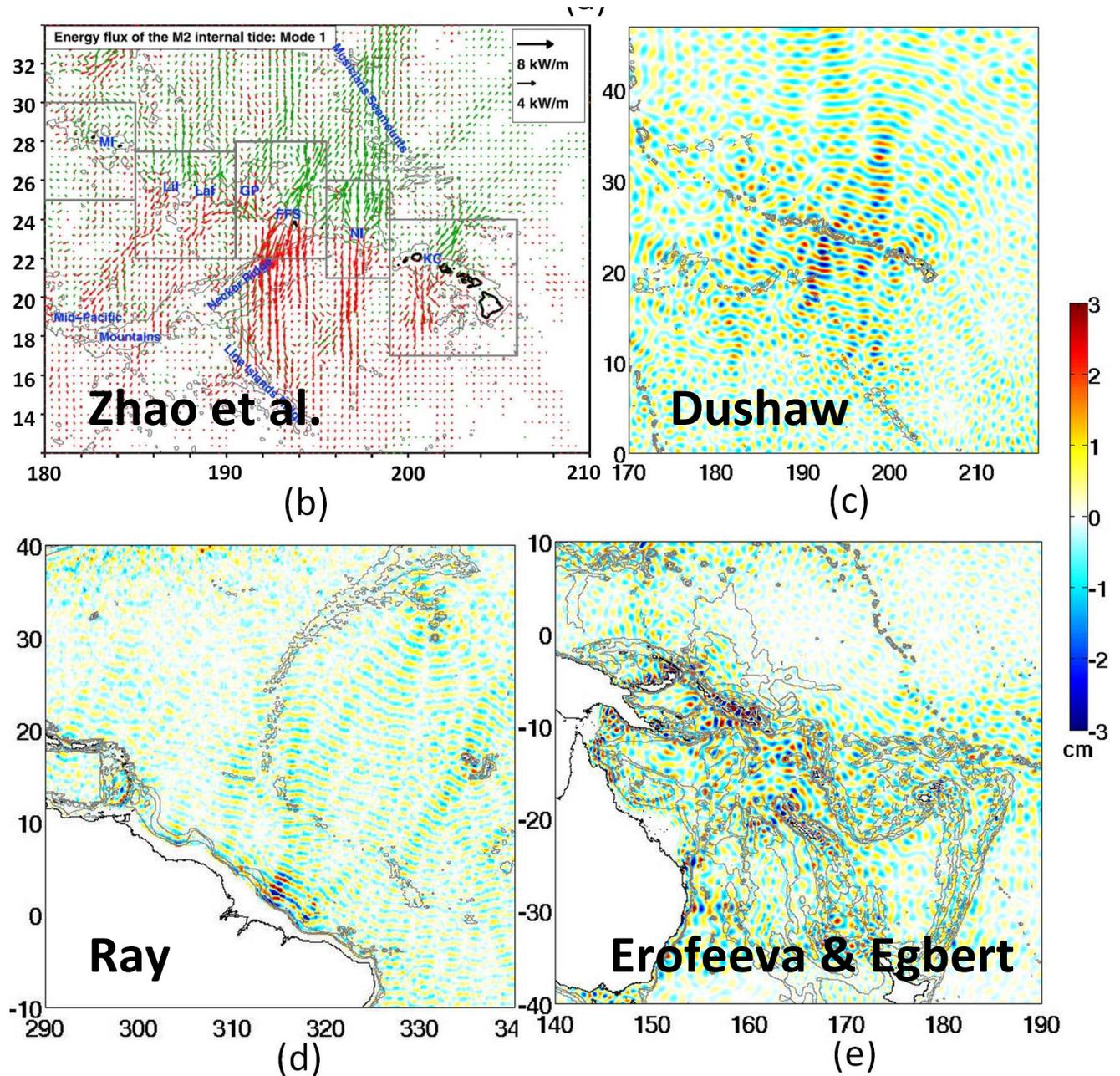
Internal tides

→ Provide SWOT mission with reliable models of coherent internal tide heights



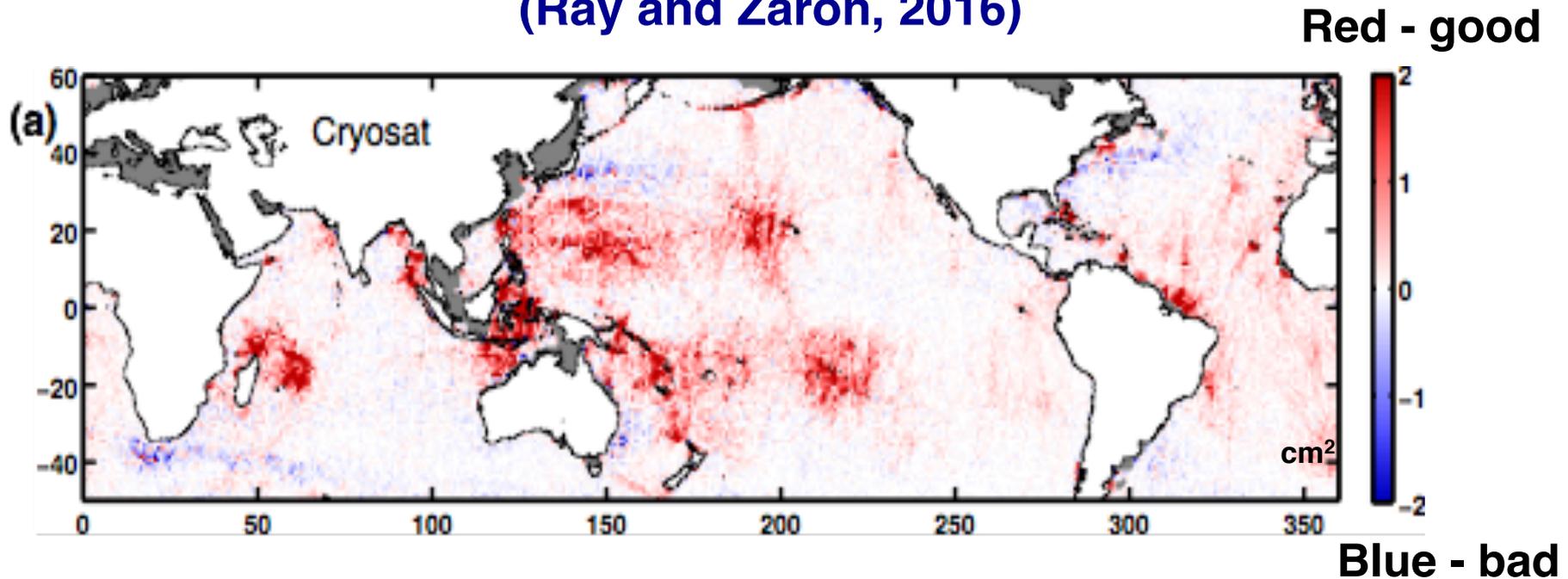
Initial global model for coherent M2 mode 1 : Erofeeva and Egbert, data assimilation with reduced gravity OTIS

Several groups have been working on mapping coherent internal tides



Testing and comparing internal-tide models:

For example: variance reduction (cm^2) with independent data
(Ray and Zaron, 2016)



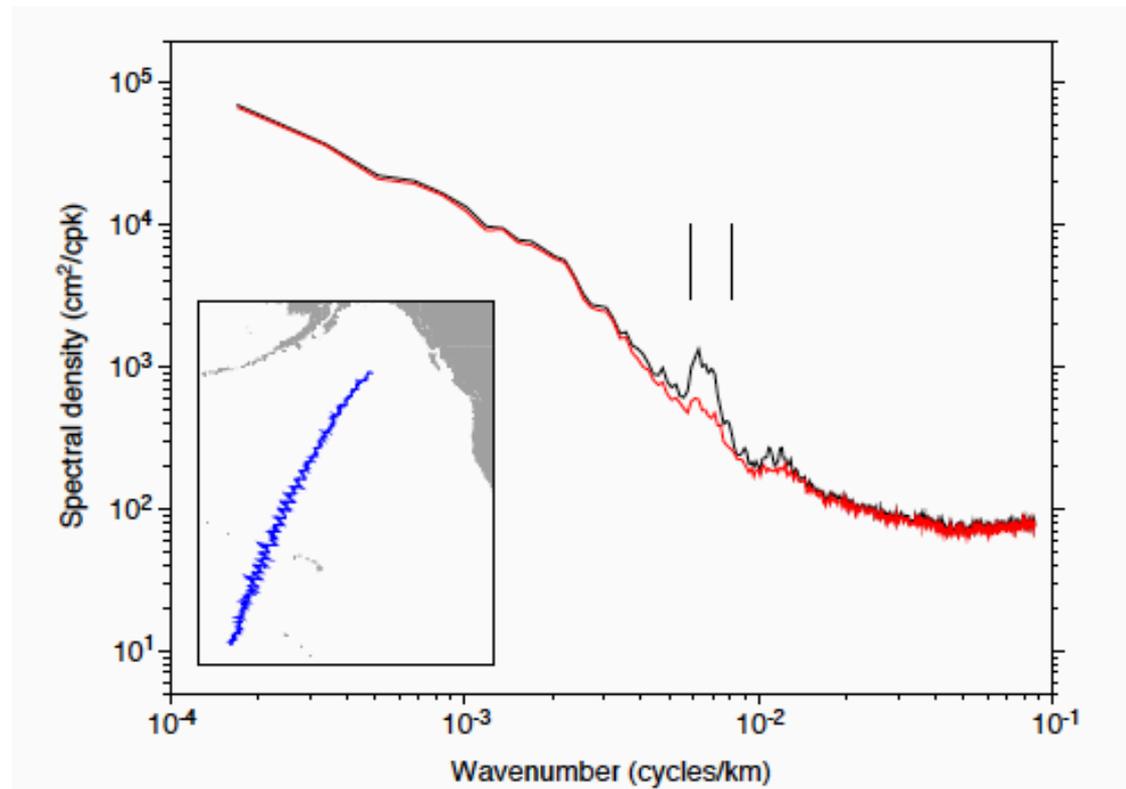
Working group task: Design tests to compare and assess accuracy of candidate models

In addition to independent (e.g., geodetic mission) altimetry data, can we find (or collect) In situ data for validation? (PIES?)

Internal tides

→ Better understand coherence/incoherence:
analysis of existing altimetry data

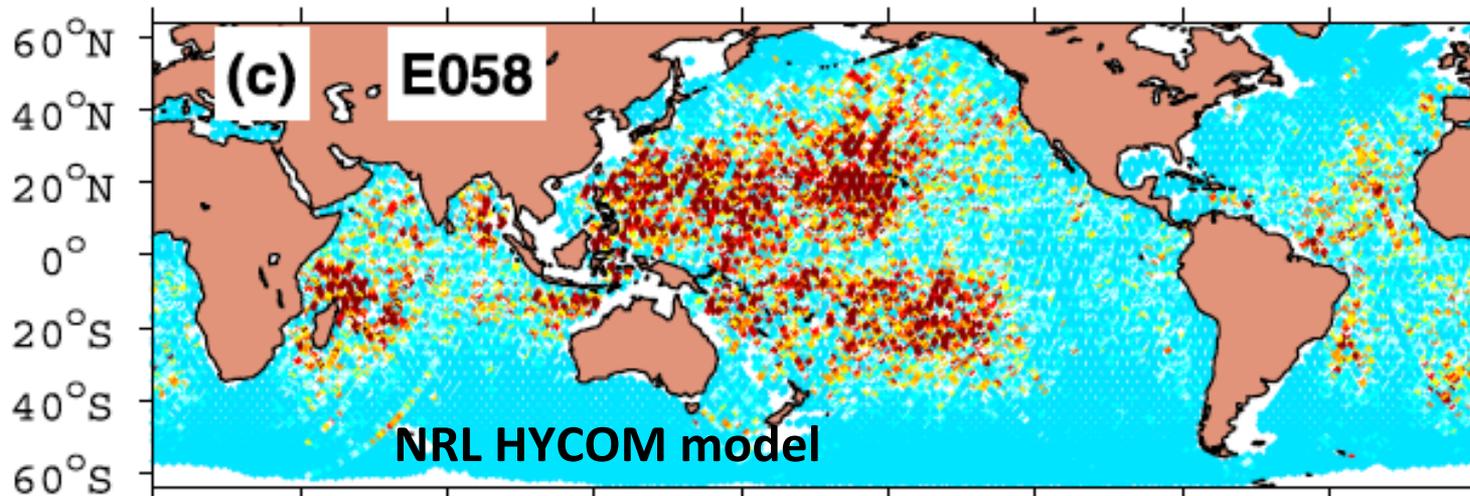
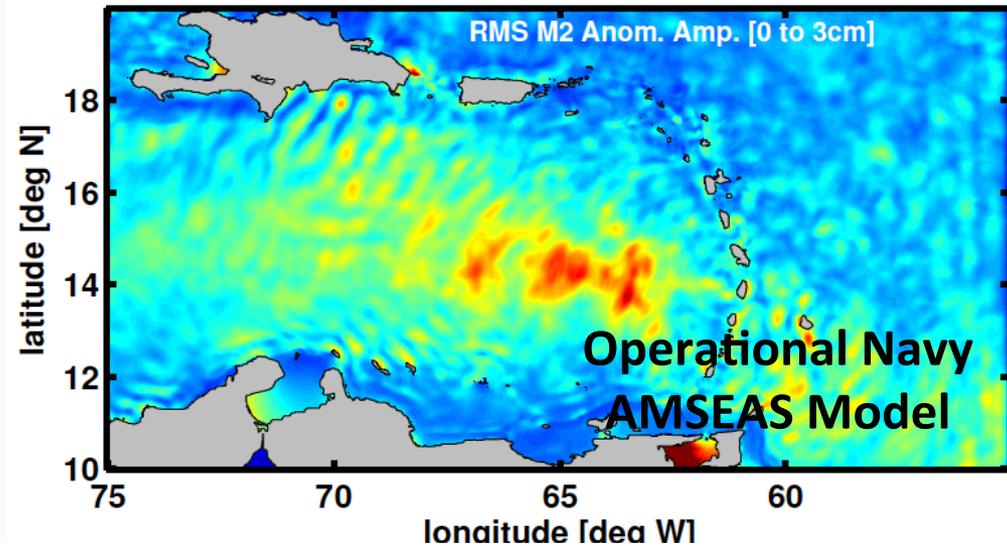
**Estimates of
incoherent internal
tide power from
along track
wavenumber spectra
(Ray and Zaron, 2011)**



Internal tides

→ Better understand coherence/incoherence

3D numerical
models of ocean
circulation with
tidal forcing

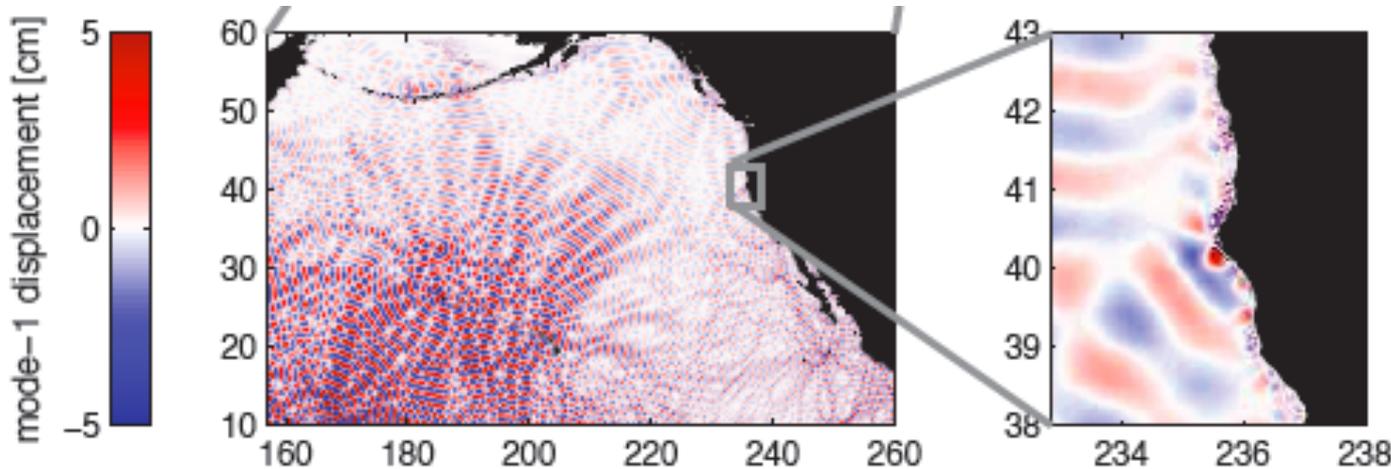
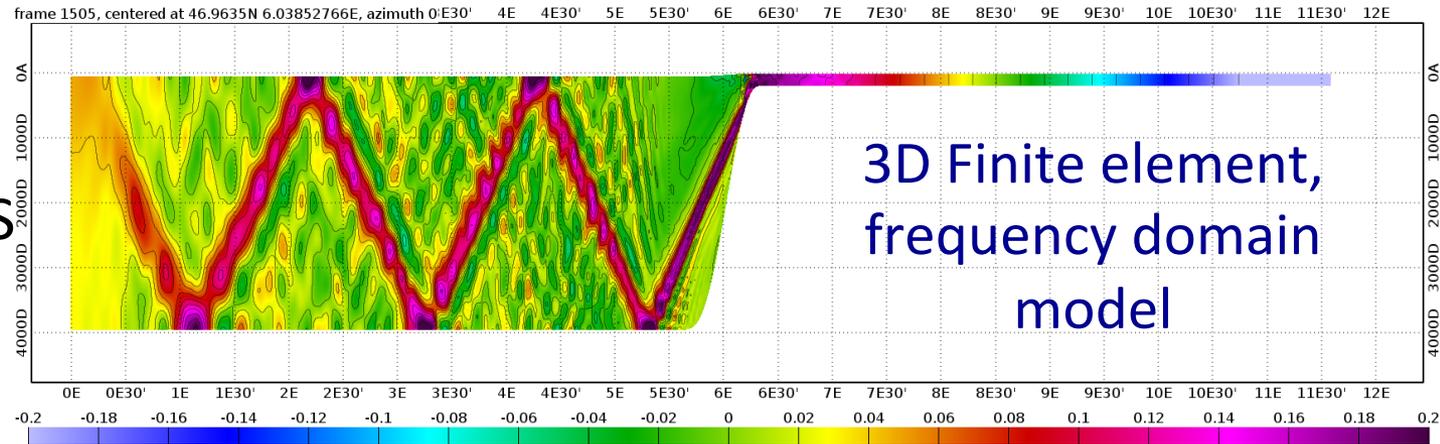


Ansong, Arbic,
Buijsman,
Metzger,
Richman, Shriver,
Timko, Wallcraft,
et al.

Internal tides

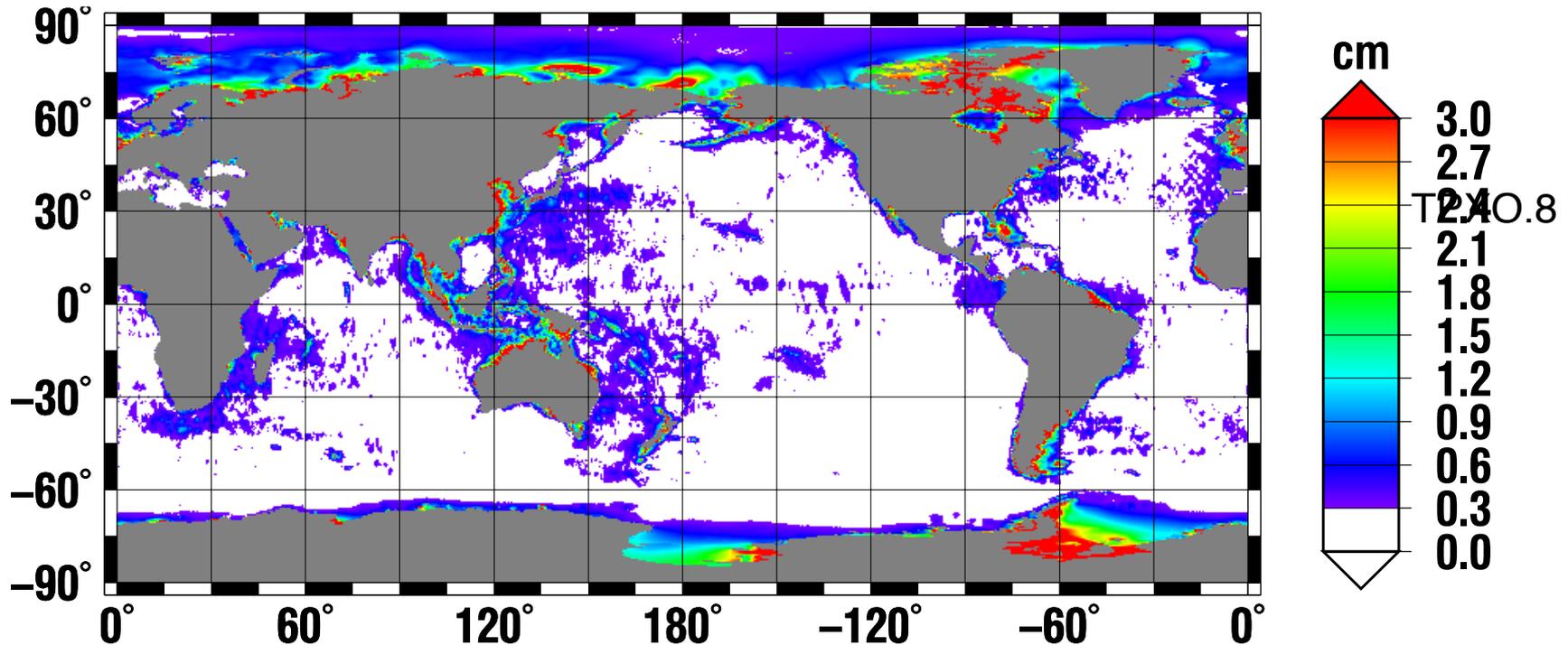
→ Better understand coherence/incoherence:
Idealized models

F. Lyard, D.
Allain, C.
Nguyen, LEGOS
Toulouse



S. Kelly
Efficient approach
to modeling IT:
coupled-Mode
shallow water
model (CSW)

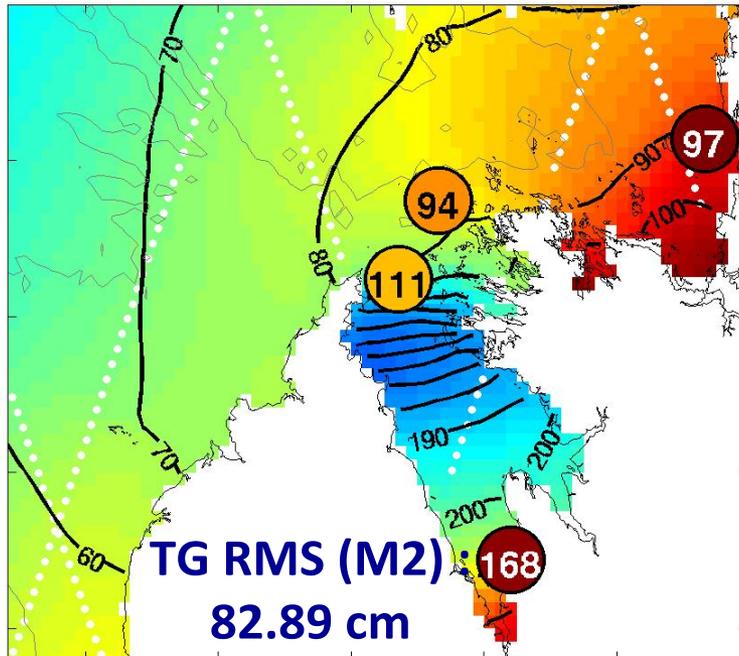
RMS difference between 7 global tidal models (Stammer et al., 2014)



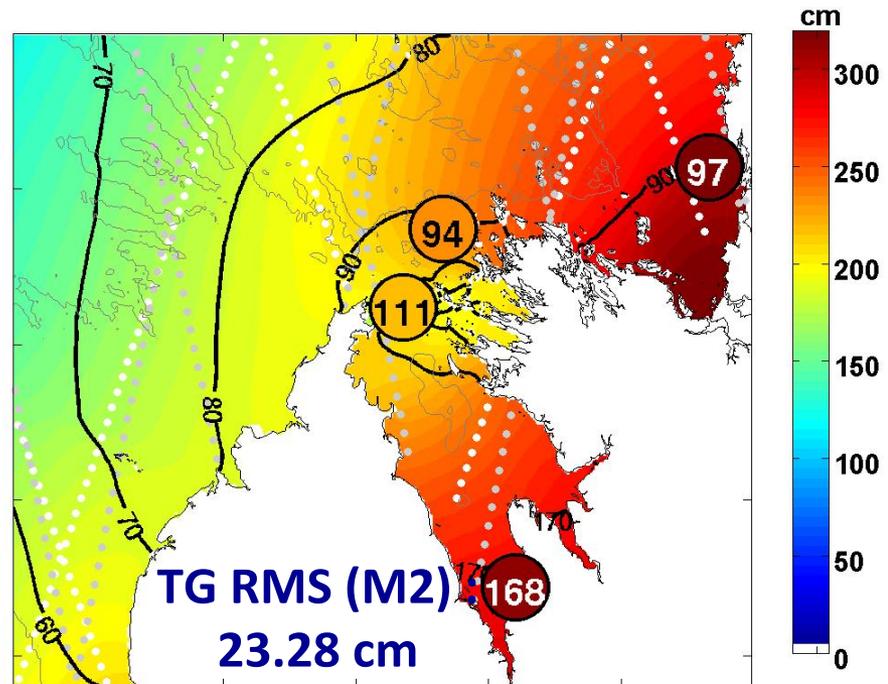
**SWOT will require improvements for tidal corrections
in shallow seas, and at higher latitudes**

Accurate models for shallow seas and coastal areas requires careful local modeling (and data assimilation)

4 km regional solution

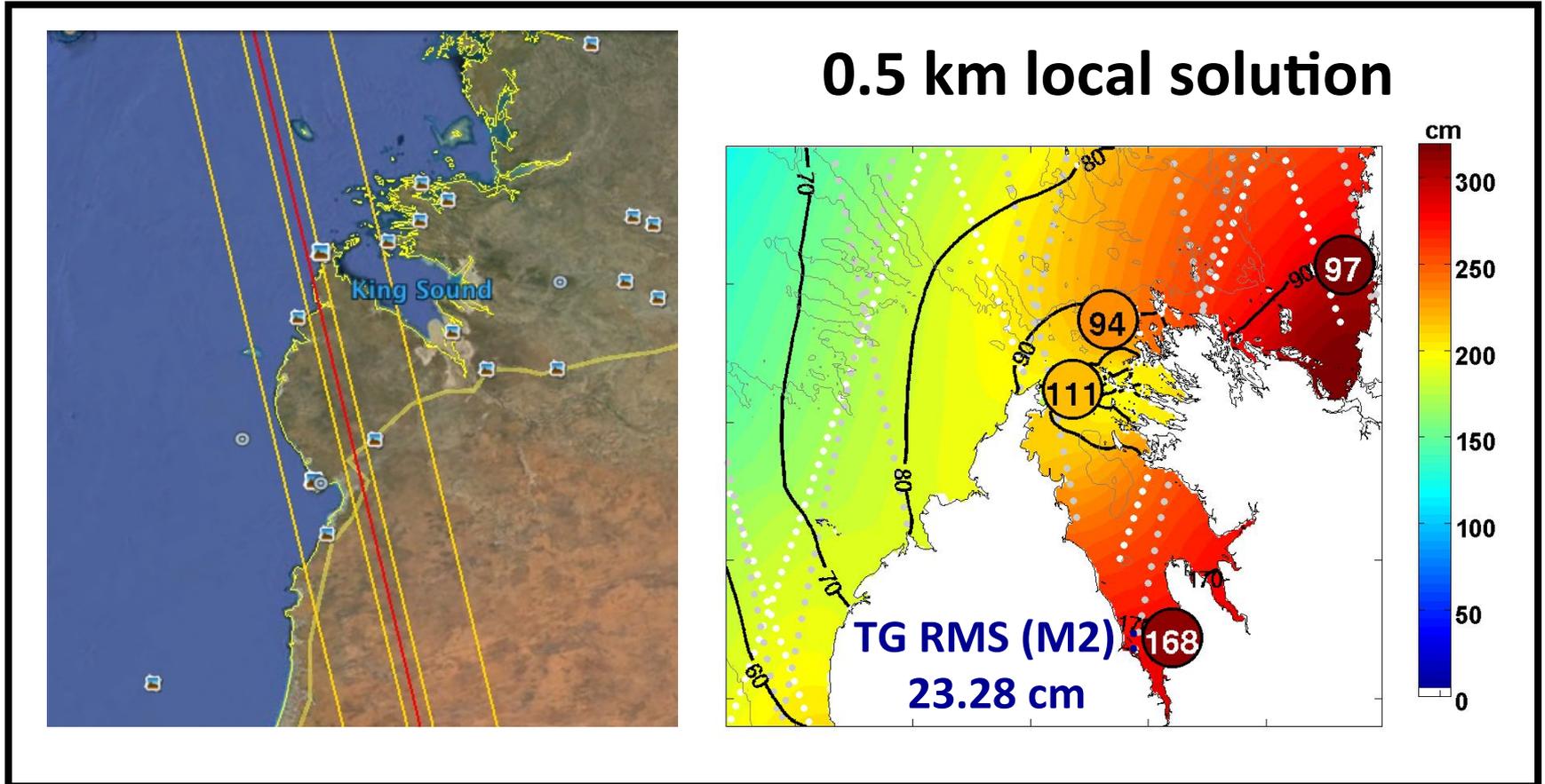


0.5 km local solution



King Sound, N.W. Australia

Accurate models for shallow seas and coastal areas requires careful local modeling (and data assimilation)

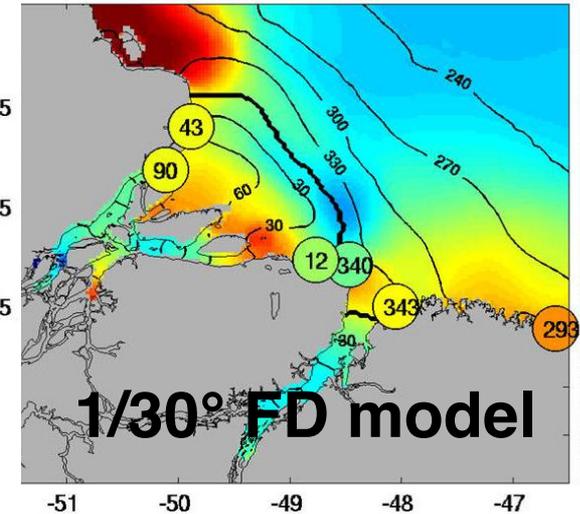
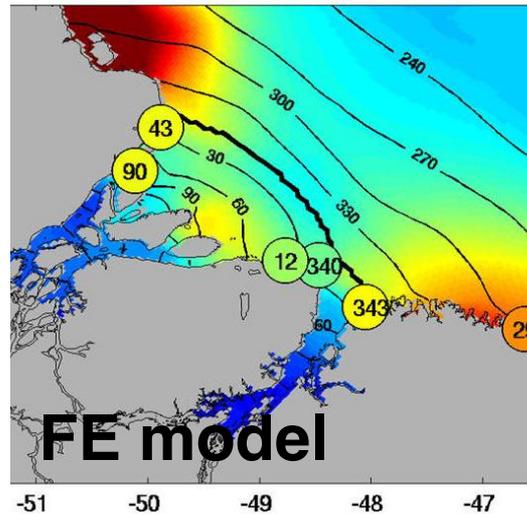


Initial efforts should focus on areas overflowed by 1 day repeat ground tracks

Key Tide Working Group Task: Development and Testing of Local Models

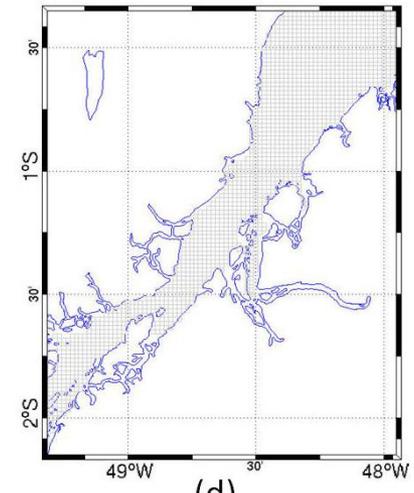
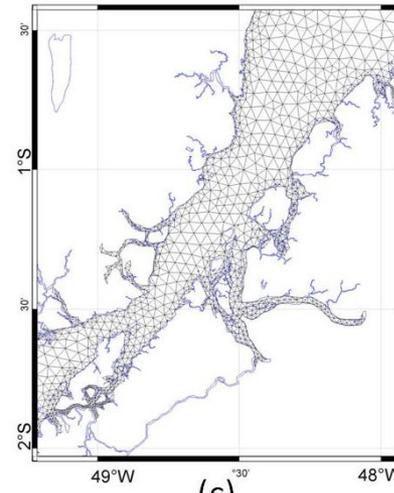
Need:

- local tide data for validation/assimilation
- Accurate bathymetry



Example: Amazon Shelf and Estuary

**Integrate Results
into an “Atlas” for
SWOT tidal
corrections ...
how?**



Summary: tide working group

Internal tides:

- assess accuracy of coherent internal tide models; recommend corrections for initial SWOT data
- incoherent tides: further develop understanding – try to provide partial correction, at the least flags

Barotropic tides

- Develop atlas of local high-resolution models for coastal and shallow sea areas, merged into global solution
- Improve tidal models at high latitudes